Toshiba BU406M Instruction Manual

Bu series cmos camera

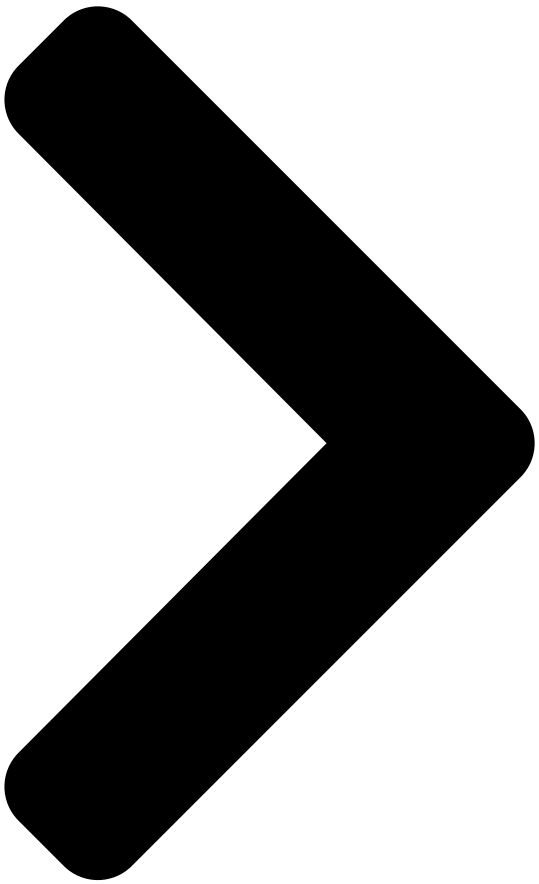
1
Table Of Contents
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17

Table of Contents

Bookmarks

Quick Links

Download this manual



BU Series
CMOS Camera

Instruction Manual

Model

BU406M

Thank you for purchasing our product.

Before using this CMOS camera, please read through this instruction manual carefully in order to use this product correctly and safely.
After reading, keep this instruction manual handy so that you can refer to, whenever you need it.

Information contained in this document is subject to change without prior notice.
Copyright © 2013 TOSHIBA TELI CORPORATION, All rights reserved.

D4223121B

www.toshiba-teli.co.jp

Table of Contents

Next Page

1
2
3
4
5

Related Manuals for Toshiba BU406M

Digital Camera Toshiba BU205M Specifications

Cmos camera (34 pages)

Digital Camera Toshiba BU406M Specifications

Cmos camera bu series (27 pages)

Digital Camera Toshiba BU238M Instruction Manual

Bu series cmos camera (79 pages)

Digital Camera Toshiba BU302MG Instruction Manual

(83 pages)

Digital Camera Toshiba BU302MG Manual

Cmos camera (35 pages)

Digital Camera Toshiba BU505MCG Instruction Manual

Cmos camera (94 pages)

Digital Camera Toshiba BU Series Instruction Manual

Cmos camera (81 pages)

Digital Camera Toshiba BU1207MG Manual

Cmos camera (35 pages)

Digital Camera Toshiba BC Series Instruction Manual

Cmos camera (75 pages)

Digital Camera Toshiba PDR-3300 Owner's Manual

Toshiba pdr-3300: owner manual (135 pages)

Digital Camera Toshiba PDR-4300 Software Manual

Toshiba pdr-4300: software manual (30 pages)

Digital Camera Toshiba PDR-M25 Owner's Manual

Toshiba pdr-m25: owner manual (102 pages)

Digital Camera Toshiba PDR-M500 Instruction Manual

Toshiba pdr-m500: owners manual (120 pages)

Digital Camera Toshiba IK-TU51CU Service Manual

Ccd camera (80 pages)

Digital Camera Toshiba PDR-2300 Owner's Manual

Toshiba pdr-2300: owner manual (98 pages)

Digital Camera Toshiba PDR-2 Quick Reference Manual

Toshiba pdr-2: quick start (21 pages)

Summary of Contents for Toshiba BU406M

Page 1: Instruction Manual

After reading, keep this instruction manual handy so that you can refer to, whenever you need it. Information contained in this document is subject to change without prior notice. D4223121B Copyright © 2013 TOSHIBA TELI CORPORATION, All rights reserved. www.toshiba-teli.co.jp...

Page 2: Table Of Contents

Decimation ..... 56 Reverse .....58 EventNotification ..... 59 Appendix .....61 MultiFrame and Bulk function difference .....61 Warranty rules .....64 Repair ..... 65 1 / 65 D4223121B

Copyright © 2013 TOSHIBA TELI CORPORATION, All rights reserved. www.toshiba-teli.co.jp...

Page 3: Safety Precautions

The content of prohibition is shown by a picture or words beside the symbol. This sign indicates MANDATORY ACTION (You are required to do). MANDATORY The content of action is shown by a picture or words beside the symbol. 2 / 65 D4223121B Copyright © 2013 TOSHIBA TELI CORPORATION, All rights reserved. www.toshiba-teli.co.jp...

Page 4: General Handing

Do not be handled roughly, damaged, fabricated, bent forcefully, pulled, twisted, bundled, placed under heavy objects or heated the power cable and the connection cable. Avoid Otherwise, fire or electric shock may result. 3 / 65 D4223121B Copyright © 2013 TOSHIBA TELI CORPORATION, All rights reserved. www.toshiba-teli.co.jp...

Page 5

(every approx five years). Accumulation of dust inside the equipment may result in fire or electric shock. For inspection and cleaning costs, contact your sales representative. Instruction 4 / 65 D4223121B Copyright © 2013 TOSHIBA TELI CORPORATION, All rights reserved. www.toshiba-teli.co.jp...

Page 6: Cases For Indemnity (Limited Warranty)

● The item that is not described in specifications of this product is out of the guarantee. ● The case of damages or losses which are caused by incorrect connection of the cable is out of the guarantee. 5 / 65 D4223121B Copyright © 2013 TOSHIBA TELI CORPORATION, All rights reserved. www.toshiba-teli.co.jp...

Page 7: Restriction For Use

(*2): Equipment relating to maintenance of public services/functions involving factors of safety refers to. - Traffic control systems for air transportation, railways, roads, or marine transportation - Equipment for nuclear power generation - Equipment related to the above 6 / 65 D4223121B Copyright © 2013 TOSHIBA TELI CORPORATION, All rights reserved. www.toshiba-teli.co.jp...

Page 8: Notes On Using This Product

Avoid intense light such as spot lights on part of the screen because it may cause blooming or smears. If intense light falls on the screen, vertical stripes may appear on the screen, but this is not a malfunction. 7 / 65 D4223121B Copyright © 2013 TOSHIBA TELI CORPORATION, All rights reserved. www.toshiba-teli.co.jp...

Page 9

Never use alcohol, benzene, thinner, or other chemicals because such chemicals may damage or discolor the paint and indications. If the image pickup surface becomes dusty, contaminated, or scratched, consult your sales representative. 8 / 65 D4223121B Copyright © 2013 TOSHIBA TELI CORPORATION, All rights reserved. www.toshiba-teli.co.jp...

Page 10

The brightness of the upper part of the screen may be different from that of the lower part. Note that this is a characteristic of a CMOS image sensor and is not a fault. 9 / 65 D4223121B Copyright © 2013 TOSHIBA TELI CORPORATION, All rights reserved. www.toshiba-teli.co.jp...

Page 11

Internal buffer Internal buffer materials materials□ □ □ □ Bag materials □□□□□□□ □□□□ □□□ □□□□□□□ □□□□□□□ □□ □□ □□ □□ Paper board Paper board Paper board Paper board 10 / 65 D4223121B Copyright © 2013 TOSHIBA TELI CORPORATION, All rights reserved. www.toshiba-teli.co.jp...

Page 12: Installation

● TOSHIBA TELI CORPORATION Top Page http://www.toshiba-teli.co.jp/index.htm ● Service & Support https://www.toshiba-teli.co.jp/cgi/ss/en/service.cgi Please refer to the TeliU3vSDK startup guide, about Operation environment, Installation, and Setup. 11 / 65 D4223121B Copyright © 2013 TOSHIBA TELI CORPORATION, All rights reserved. www.toshiba-teli.co.jp...

Page 13: Specifications

Specifications Overview This BU406M is an integrated-(one-body)-type monochrome camera that adopts 1/1 type 4M pixel CMOS sensor. For video output and camera control, the USB 3.0

interface standard is adopted for high transfer rate, and it is easy to integrate into industrial equipment.

Page 14

* IIDC2 is a unified standard established by JIIA (Japan Industrial Association). *e-CON (Easy & Economy connector) is a sensor connector that is normalized by the manufacturer of the sensor, FA equipment and connector. 13 / 65 D4223121B Copyright © 2013 TOSHIBA TELI CORPORATION, All rights reserved. www.toshiba-teli.co.jp...

Page 15: Configuration

*1: Optional part. Contact your sales representative for details of option units. *2: Commercial items. 14 / 65 D4223121B Copyright © 2013 TOSHIBA TELI CORPORATION, All rights reserved. www.toshiba-teli.co.jp...

Page 16: Connection

Please confirm wires' specifications before use them. Lost packets may occur by an electrical characteristic of the transmission line of USB3.0. (USB3.0 Interface Card, USB3.0 Cable, and USB3.0 HUB). 15 / 65 D4223121B Copyright © 2013 TOSHIBA TELI CORPORATION, All rights reserved. www.toshiba-teli.co.jp...

Page 17: Connector Pin Assignment

* Matching connector is not an accessory of this product. Pin assignment ↑TOP *Above figure is connector view from insert side. Pin No. Signal Function GPIO(Line2) GPIO Output GPIO(Line1) GPIO Output Ground TRIG_IN(Line0) Trigger Input 16 / 65 D4223121B Copyright © 2013 TOSHIBA TELI CORPORATION, All rights reserved. www.toshiba-teli.co.jp...

Page 18: Outline Drawing

Outline Drawing 17 / 65 D4223121B Copyright © 2013 TOSHIBA TELI CORPORATION, All rights reserved. www.toshiba-teli.co.jp...

Page 19: General Specifications

Camera body grounding: No conductive between circuit GND and camera body insulation status *1 F1.4, Gain: Maximum (x8), video level: 50% *2 at the all pixel readout 18 / 65 D4223121B Copyright © 2013 TOSHIBA TELI CORPORATION, All rights reserved. www.toshiba-teli.co.jp...

Page 20

Depends on your PC and USB3.0 interface card configurations, images may not be captured properly (e.g. dropping frames). In this case, change frame rate setting lower. 19 / 65 D4223121B Copyright © 2013 TOSHIBA TELI CORPORATION, All rights reserved. www.toshiba-teli.co.jp...

Page 21: Led Status

Slow flash orange (ON: 400ms, OFF: 1600ms) Data being transferred Solid Green Error during data transfer Solid Red (Time period: 500ms) Stand-by Super slow flash orange (ON:200ms, OFF: 2800ms) 20 / 65 D4223121B Copyright © 2013 TOSHIBA TELI CORPORATION, All rights reserved. www.toshiba-teli.co.jp...

Page 22: I/O Specification

: High active / Low active (initial factory setting: Low active) Signal Source : TIMER0 ACTIVE USER OUTPUT EXPOSURE ACTIVE FRAME ACTIVE FRAME TRANSFER FRAME TRIGGER WAIT ● Circuit diagram - Trigger Input 21 / 65 D4223121B Copyright © 2013 TOSHIBA TELI CORPORATION, All rights reserved. www.toshiba-teli.co.jp...

Page 23: Timing Specification

BU406M 11.1 setting by the 11.1 application. * If the value of T2 is not set by the application, it will be the same as T1. 22 / 65 D4223121B Copyright © 2013 TOSHIBA TELI CORPORATION, All rights reserved. www.toshiba-teli.co.jp...

Page 24

When the interval of the input trigger signal is extremely short, or when the trigger signal is noisy, there is a possibility of causing the malfunction. In this case, please input a proper trigger signal. 23 / 65 D4223121B Copyright © 2013 TOSHIBA TELI CORPORATION, All rights reserved. www.toshiba-teli.co.jp...

Page 25: Typical Spectral Response

Typical Spectral Response * The lens characteristics and light source characteristics is not reflected in table. ● BU406M 1000 Wave Length [nm] 24 / 65 D4223121B Copyright © 2013 TOSHIBA TELI CORPORATION, All rights reserved. www.toshiba-teli.co.jp...

Page 26: Operating Ambient Conditions

Please provide sufficient heat radiation depending on your installation. ● EMC Conditions - EMI (Electro-Magnetic Interference): EN61000-6-4 FCC Part 15 Subpart B Class A - EMS (Electro-Magnetic Susceptibility): EN61000-6-2 25 / 65 D4223121B Copyright © 2013 TOSHIBA TELI CORPORATION, All rights reserved. www.toshiba-teli.co.jp...

Page 27 - e-CON connector XN2A-1470 (OMRON Corporation) - Shielded wire UL1533 (AWG28) (Hitachi cable, Ltd.) Connection: Please confirm the EMC adaptability when it combines with parts other than them. 26 / 65 D4223121B Copyright © 2013 TOSHIBA TELI CORPORATION, All rights reserved. www.toshiba-teli.co.jp...

Page 28: Functions

Functions This section introduces standard functions. BU406M provides following functions. Category Function USB3 Vision Bootstrap Registers USB3 Vision standard registers DeviceControl DeviceControl Device information ImageFormatControl ImageFormatSelector Image format selection Scalable Scalable control PixelFormat Pixel format selection AcquisitionControl AcquisitionControl Image stream start / stop...

Page 29: Bootstrap Registers

When opening and closing the stream channel, it is required to control StreamEnable plus SDK setups on your application. Please refer to the TeliU3vSDK for details. 28 / 65 D4223121B Copyright © 2013 TOSHIBA TELI CORPORATION, All rights reserved. www.toshiba-teli.co.jp...

Page 30: Devicecontrol

DeviceModelName Beginner Returns the model name. DeviceManufacturerInfo Beginner Returns the manufacturer information. DeviceVersion Beginner Returns the device version. DeviceID Beginner Returns the device ID (serial number). 29 / 65 D4223121B Copyright © 2013 TOSHIBA TELI CORPORATION, All rights reserved. www.toshiba-teli.co.jp...

Page 31: Imageformatcontrol

Changing “ImageFormatSelector” register value is invalid during image stream data output. Decimation function is disabled when the camera is running in Scalable mode. Scalable function is disabled when the camera is running in Decimation mode. 30 / 65 D4223121B Copyright © 2013 TOSHIBA TELI CORPORATION, All rights reserved. www.toshiba-teli.co.jp...

Page 32: Scalable

Sets horizontal offset (in pixels) from the origin to the region of interest. OffsetY Beginner Sets vertical offset (in pixels) from the origin to the region of interest. 31 / 65 D4223121B Copyright © 2013 TOSHIBA TELI CORPORATION, All rights reserved. www.toshiba-teli.co.jp...

Page 33 OffsetX unit size OffsetY unit size * initial factory setting ● Note Changing “Width”, “Height”, “OffsetX”, “OffsetY” register value is invalid during image stream data output. 32 / 65 D4223121B Copyright © 2013 TOSHIBA TELI CORPORATION, All rights reserved. www.toshiba-teli.co.jp...

Page 34: Pixelformat

PixelFormat Select a pixel format of image stream data. BU406M provides Mono8 bit Pixel format. ● Registers Register Visibility Access Description PixelCoding Beginner Returns a pixel coding. BU406M supports Mono coding. PixelSize Beginner Selects a bit size of image pixel.

Page 35: Acquisitioncontrol

* initial factory setting - Set the number of frames to transfer (In MultiFrame mode) Set the number of frames to transfer to “AcquisitionFrameCount”. Setting value is Integer type. 34 / 65 D4223121B Copyright © 2013 TOSHIBA TELI CORPORATION, All rights reserved. www.toshiba-teli.co.jp...

Page 36 Depends on your PC or USB3.0 interface card configurations, images may not be captured normally (e.g. frame drops may occur). In this case, change to frame rate setting lower. 35 / 65 D4223121B Copyright © 2013 TOSHIBA TELI CORPORATION, All rights reserved. www.toshiba-teli.co.jp...

Page 37: Imagebuffer

- Read images from the buffer Read the number of AcquisitionFrameCount image(s) from the buffer by executing “ImageBufferRead” register command (it is equivalent to write value 10 to “AcquisitionCommand” register). 36 / 65 D4223121B Copyright © 2013 TOSHIBA TELI CORPORATION, All rights reserved. www.toshiba-teli.co.jp...

Page 38 [Start] button in TeliU3vViewer can’t deal with “StreamEnable” register alone. Please substitute procedure “StreamEnable” = 1 to following instructions. - Push [Start] button on TeliU3vViewer main window. - Execute [AcquisitionStop] in XML window. 37 / 65 D4223121B Copyright © 2013 TOSHIBA TELI CORPORATION, All rights reserved. www.toshiba-teli.co.jp...

Page 39: Exposuretime

The frame rate is determined by giving priority to ExposureTime setting value. * initial factory setting Model BU406M ExposureTime (*) 11111 [µs] ExposureTimeMin 30 [µs] ExposureTimeMax 16000000 [µs] * initial factory setting ● Note 38 / 65 D4223121B Copyright © 2013 TOSHIBA TELI CORPORATION, All rights reserved. www.toshiba-teli.co.jp...

Page 40: Blacklevel

Set the following value to “BlackLevel” register. Setting value is Float type. BlackLevel Value Minimum -25.00[%] Maximum +25.00[%] * initial factory setting = 0.00[%] ● Note 39 / 65 D4223121B Copyright © 2013 TOSHIBA TELI CORPORATION, All rights reserved. www.toshiba-teli.co.jp...

Page 41: Gain

Setting the gain value too high increases noises. When you adjust the brightness of the image, I ask you to have final image quality checked with your environment. 40 / 65 D4223121B Copyright © 2013 TOSHIBA TELI CORPORATION, All rights reserved. www.toshiba-teli.co.jp...

Page 42: Gamma

- Set Gamma correction Set the following value to “Gamma” register. Setting value is Float type. Gamma Value Minimum 0.45 Maximum (*) 1.00 * initial factory setting ● Note 41 / 65 D4223121B Copyright © 2013 TOSHIBA TELI CORPORATION, All rights reserved. www.toshiba-teli.co.jp...

Page 43: Triggercontrol

Random Trigger Shutter mode Trigger pulse width control SoftwareTrigger -Edge mode:TriggerSequence0 -Bulk mode:TriggerSequence6 “ExposureTime” register control * The camera operation not mentioned above is not guaranteed. 42 / 65 D4223121B Copyright © 2013 TOSHIBA TELI CORPORATION, All rights reserved. www.toshiba-teli.co.jp...

Page 44 And you can add delay time from trigger edge to exposure start by register setting. Fig. Trigger Delay Details of Random Trigger Shutter operation, refer to "Timing" of "Specification". 43 / 65 D4223121B Copyright © 2013 TOSHIBA TELI CORPORATION, All rights reserved. www.toshiba-teli.co.jp...

Page 45 - Select trigger source Set the following value to “TriggerSource” register. Setting value is Enumeration type. TriggerSource Function Line0 (*) Hardware trigger TriggerSoftware Software trigger * initial factory setting 44 / 65 D4223121B Copyright © 2013 TOSHIBA TELI CORPORATION, All rights reserved. www.toshiba-teli.co.jp...

Page 46 When executes “TriggerSoftware” register command, software trigger command is generated. Camera starts exposure by receiving software trigger command. ● Note In SoftwareTrigger operation, the delay time from “TriggerSoftware” to exposure is not guaranteed. 45 / 65 D4223121B Copyright © 2013 TOSHIBA TELI CORPORATION, All rights reserved. www.toshiba-teli.co.jp...

Page 47: Usersetcontrol

PixelCoding/Size/Endian TimerTriggerSource DecimationHorizontal/Vertical LineModeAll ReverseX/ReverseY LineInverterAll AcquisitionFrameRate DigitalIOControl UserOutputValueAll AcquisitionControl AcquisitionFrameInterval LineSelector ExposureTime LineSource BlackLevel TimerSelector LuminanceControl Gain CounterAndTimerControl TimerDelay Gamma TimerDuration LEDIndicatorLuminance VenderUniqueControl TestPattern EventNotification 46 / 65 D4223121B Copyright © 2013 TOSHIBA TELI CORPORATION, All rights reserved. www.toshiba-teli.co.jp...

Page 48 Description Default (*) Memory bank to read initial factory setting data. UserSet0 Memory bank 0 for user setting. * initial factory setting ● Note 47 / 65 D4223121B Copyright © 2013 TOSHIBA TELI CORPORATION, All rights reserved. www.toshiba-teli.co.jp...

Page 49: Digitaliocontrol

Returns the status of each Line signal. UserOutputValueAll Beginner Sets the user output value. LineSelector Beginner Selects the Line of I/O connector. LineSource Beginner Selects the source of the output signal. 48 / 65 D4223121B Copyright © 2013 TOSHIBA TELI CORPORATION, All rights reserved. www.toshiba-teli.co.jp...

Page 50 Each bit corresponds to each Line (bit0=Line0, bit1=Line1). Line1 and Line2 are available. Line0 is dedicated trigger input. UserOutputValueAll Function 0 (*) Low level output High level output * initial factory setting 49 / 65 D4223121B Copyright © 2013 TOSHIBA TELI CORPORATION, All rights reserved. www.toshiba-teli.co.jp...

Page 51 0 (*) non inverted inverted * initial factory setting Fig. GPIO internal circuit diagram ● Note About the details of Timer0Active signal, refer to “TimerControl” of "Functions". 50 / 65 D4223121B Copyright © 2013 TOSHIBA TELI CORPORATION, All rights reserved. www.toshiba-teli.co.jp...

Page 52: Timercontrol

TimerDuration Beginner Sets the width of Timer0Active pulse. TimerDelay Beginner Sets the delay of Timer0Active pulse. TimerTriggerSource Beginner Selects the source of Timer0Active pulse to start. 51 / 65 D4223121B Copyright © 2013 TOSHIBA TELI CORPORATION, All rights reserved. www.toshiba-teli.co.jp...

Page 53 HardwareTrigger and Software Trigger mode, and not to be responsed at FrameTriggerError. ExposureStart is available in both HardwareTrigger and Software Trigger mode, and not to be responsed at Timer0Active pulse delays TiggerDelay+TimerDelay[us]. FrameTriggerError. 52 / 65 D4223121B Copyright © 2013 TOSHIBA TELI CORPORATION, All rights reserved. www.toshiba-teli.co.jp...

Page 54: Ledindicatorluminance

- Set LED indicator luminance Set the following value to “LEDIndicatorLuminance” register. Setting value is Float type. LEDIndicatorLuminance Value Minimum 0.00(%) Maximum (*) 100.00(%) * initial factory setting ● Note 53 / 65 D4223121B Copyright © 2013 TOSHIBA TELI CORPORATION, All rights reserved. www.toshiba-teli.co.jp...

Page 55: Testpattern

TestPattern BU series support test pattern data output. Camera provides following Test patterns; Black White GreyB GreyA GreyHorizontalRamp GreyVerticalRamp Fig. Test pattern 54 / 65 D4223121B Copyright © 2013 TOSHIBA TELI CORPORATION, All rights reserved. www.toshiba-teli.co.jp...

Page 56 All pixel = 255 @Mono8 GreyB All pixel = 170 @Mono8 GreyA All pixel = 85 @Mono8 GreyHorizontalRamp Horizontal Ramp GreyVerticalRamp Vertical Ramp * initial factory setting ● Note 55 / 65 D4223121B Copyright © 2013 TOSHIBA TELI CORPORATION, All rights reserved. www.toshiba-teli.co.jp...

Page 57: Decimation

Camera reads all effective areas at high speed by skipping lines. Fig. Decimation operation ● Registers Register Visibility Access Description DecimationVertical Beginner Set the number of vertical Decimation line(s). 56 / 65 D4223121B Copyright © 2013 TOSHIBA TELI CORPORATION,

All rights reserved. www.toshiba-teli.co.jp...

Page 58 Decimation function is disabled when the camera is running in Scalable mode. Scalable function is disabled when the camera is running in Decimation mode. Changing “DecimationVertical” register value is invalid during image stream data output. 57 / 65 D4223121B Copyright © 2013 TOSHIBA TELI CORPORATION, All rights reserved. www.toshiba-teli.co.jp...

Page 59: Reverse

Set the following value to “ReverseX”, “ReverseY” registers. Setting value is Boolean type. Value Image reverse FALSE (*) Non reverse TRUE Reverse * initial factory setting ● Note 58 / 65 D4223121B Copyright © 2013 TOSHIBA TELI CORPORATION, All rights reserved. www.toshiba-teli.co.jp...

Page 60: Eventnotification

- FrameTransferEnd : End of transferring streaming data - ExposureStart : Start of Exposure - ExposureEnd : End of Exposure Events timing are as following chart. 59 / 65 D4223121B Copyright © 2013 TOSHIBA TELI CORPORATION, All rights reserved. www.toshiba-teli.co.jp...

Page 61 Set the following value to “EventNotification” registers. Setting value is Boolean type. EventNotificationOf* value Event notification FALSE (*) Inactive TRUE Active * initial factory setting ● Note 60 / 65 D4223121B Copyright © 2013 TOSHIBA TELI CORPORATION, All rights reserved. www.toshiba-teli.co.jp...

Page 62: Appendix

- Bulk function sets limits to the number of frames to exposure with TriggerAdditionalParameter register. - MultiFrame function in Normal Shutter mode (TriggerMode = Off) Camera transfers “AcquisitionFrameCount” frame(s). 61 / 65 D4223121B Copyright © 2013 TOSHIBA TELI CORPORATION, All rights reserved. www.toshiba-teli.co.jp...

Page 63 Frame 1 TriggerAdditionalParameter *Exposure overlaps sensor readout. *Exposure time is determined by ExposureTime setting. Stream USB Bus stops Frame 1 Frame 2 Frame 3 Frame 1 62 / 65 D4223121B Copyright © 2013 TOSHIBA TELI CORPORATION, All rights reserved. www.toshiba-teli.co.jp...

Page 64 This exposure is discarded. TriggerAdditionalParameter *Exposure overlaps sensor readout. *Exposure time is determined by ExposureTime setting. Stream USB Bus stops Frame 1 Frame 2 Frame 1 AcquisitionFrameCount 63 / 65 D4223121B Copyright © 2013 TOSHIBA TELI CORPORATION, All rights reserved. www.toshiba-teli.co.jp...

Page 65: Warranty Rules

9. Forgery product, products which does not have proper serial number, products of which serial number is forged, damaged or deleted 10. All defects that happened after the expiration for a warranty term 64 / 65 D4223121B Copyright © 2013 TOSHIBA TELI CORPORATION, All rights reserved. www.toshiba-teli.co.jp...

Page 66: Repair

10. The immunity from responsibility of the product is applied in the repair completion products. * Please refer for the inquiry about the software to our homepage or sales personnel. 65 / 65 D4223121B Copyright © 2013 TOSHIBA TELI CORPORATION, All rights reserved. www.toshiba-teli.co.jp...

Page 67 □ It certainly occurs. □ It sometimes occurs. □ It occurs, after time passes. □ □ Others □ <For dealer use> Reception date : Receipt No. : JOB No. : Check : D4223121B Copyright © 2013 TOSHIBA TELI CORPORATION, All rights reserved. www.toshiba-teli.co.jp...